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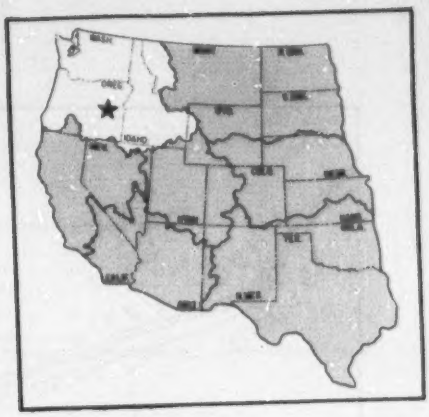
Burnt River Project

Oregon: Baker County

Pacific Northwest Region
Bureau of Reclamation



The Burnt River Project in east-central Oregon consists of a storage dam and reservoir that provide water for supplemental irrigation of about 15,000 acres which formerly depended entirely on the natural flow of the Burnt River.

PLAN

Floodwaters of the Burnt River are stored in Unity Reservoir for later release when the natural flow of the river is insufficient for irrigation purposes. The reservoir assures an adequate water supply for project lands below and above the dam by exchange of stored water for natural streamflow during the summer months.

Unity Dam

Unity Dam, located about 40 miles southwest of Baker, Oreg., is a rolled, zoned earthfill-type structure, 82 feet high above its foundation. The dam contains 254,000 cubic yards of earth and rock. The active capacity of the reservoir is 25,200 acre-feet.

Unity Dam and Reservoir

DEVELOPMENT

Early History

Early settlers in the Burnt River Valley became cattle raisers, and used the bottom lands to produce hay for winter feed. The first attempts at irrigation consisted of direct run-of-the-river diversions into farm ditches, without the benefit of storage. As the valley developed, the river usually dried up during July and August, leaving no water to mature crops.

Investigations

In 1933, the Bureau of Reclamation, in cooperation with the State of Oregon, investigated the possibility of developing a storage structure on Burnt River to provide a late summer water supply. The project was constructed following the plan developed from this investigation.

Authorization

The project was found feasible by the Secretary of the Interior on September 25, 1935. Funds were provided by the President on August 13, 1935, under the Emergency Relief Act.

Construction

Construction began on August 13, 1936, and was completed in January 1939.

Operating Agency

The project is operated and maintained by the Burnt River Irrigation District.

BENEFITS

Irrigation

Principal crops produced are alfalfa, wild hay, barley, wheat, and pasture.

Region Revision 5/82
(From Project Data Book)

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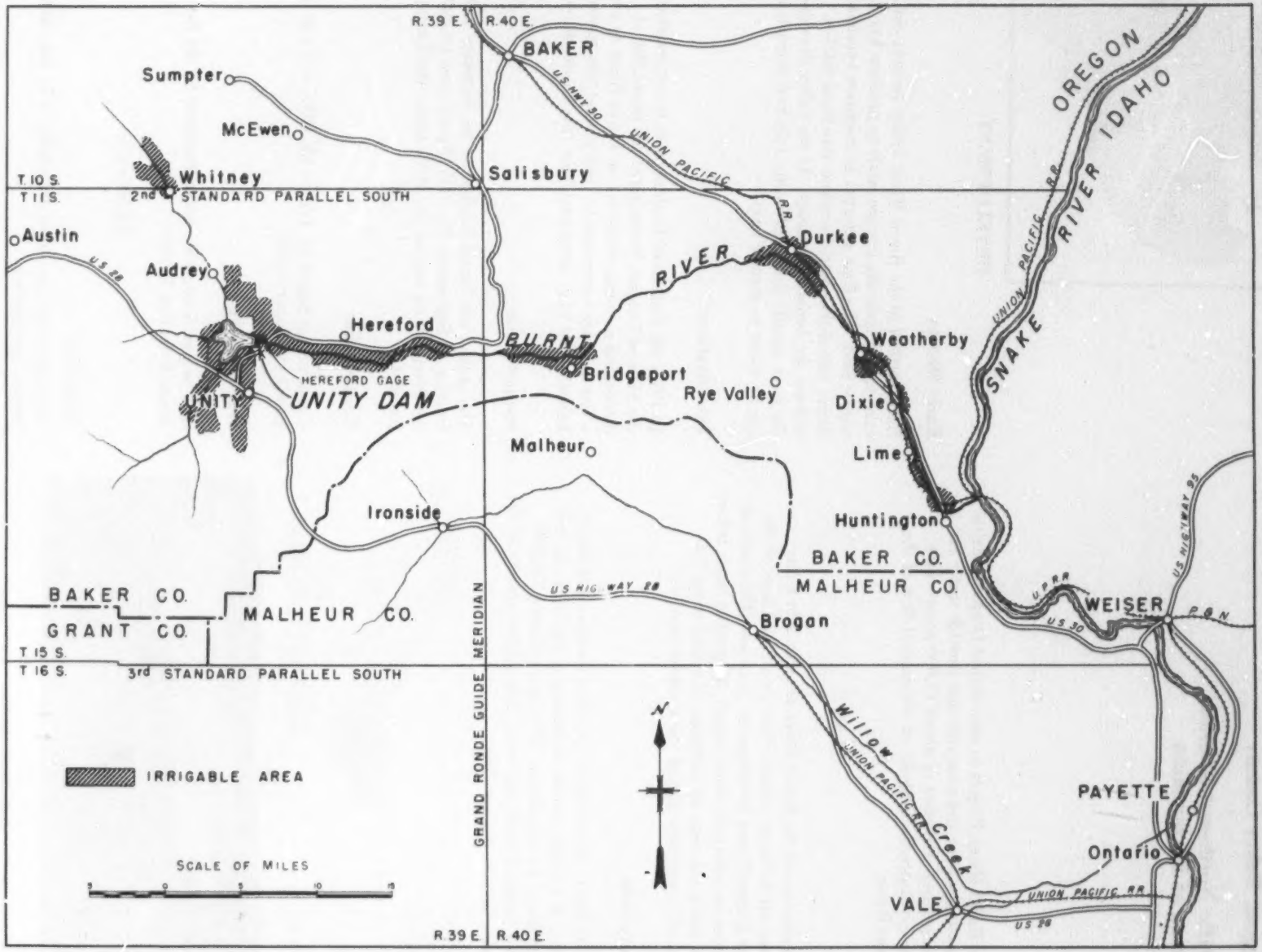
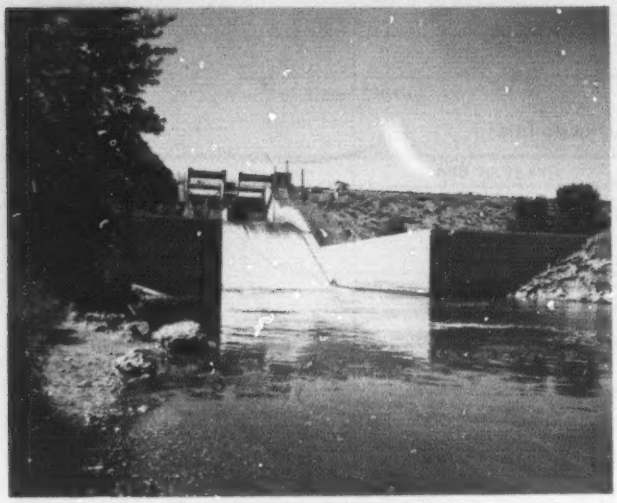


Burnt River Project

Recreation

Unity Reservoir has limited use for picnicking, swimming, and boating. Fishing in season for rainbow trout provides the greatest recreational use of the reservoir.



Unity Dam spillway

PROJECT DATA

Land Areas (1980)

Irrigable area:		
Supplemental irrigation service	15,616	acres
Number of irrigated farms	89	

Area Irrigated and Crop Value

Year	Area irrigated, acres	Crop value, dollars
1968	15,050	1,066,180
1969	15,056	759,454
1970	15,066	988,286
1971	15,026	1,250,782
1972	15,096	1,384,418
1973	15,096	1,788,762
1974	15,076	1,348,050
1975	15,071	1,445,279
1976	15,061	1,699,482
1977	15,046	1,559,914
1978	15,061	1,449,458
1979	15,021	2,498,063
1980	15,061	2,776,678

Facilities in Operation

Storage dams	1

Climatic Conditions (1966-80)

Annual precipitation	11.5	in
Temperature:		
Maximum	100	°F
Minimum	-29	°F
Mean	44	°F
Growing season	102	days
Elevation of irrigable area	2600.0	ft

Settlement

Number of persons served with project water (1980):	
Farm irrigation service	451
Other irrigation service[1]	1,300
Total	1,751

[1]Urban and suburban, residential, commercial, and industrial lands.

ENGINEERING DATA

Water Supply

BURNT RIVER

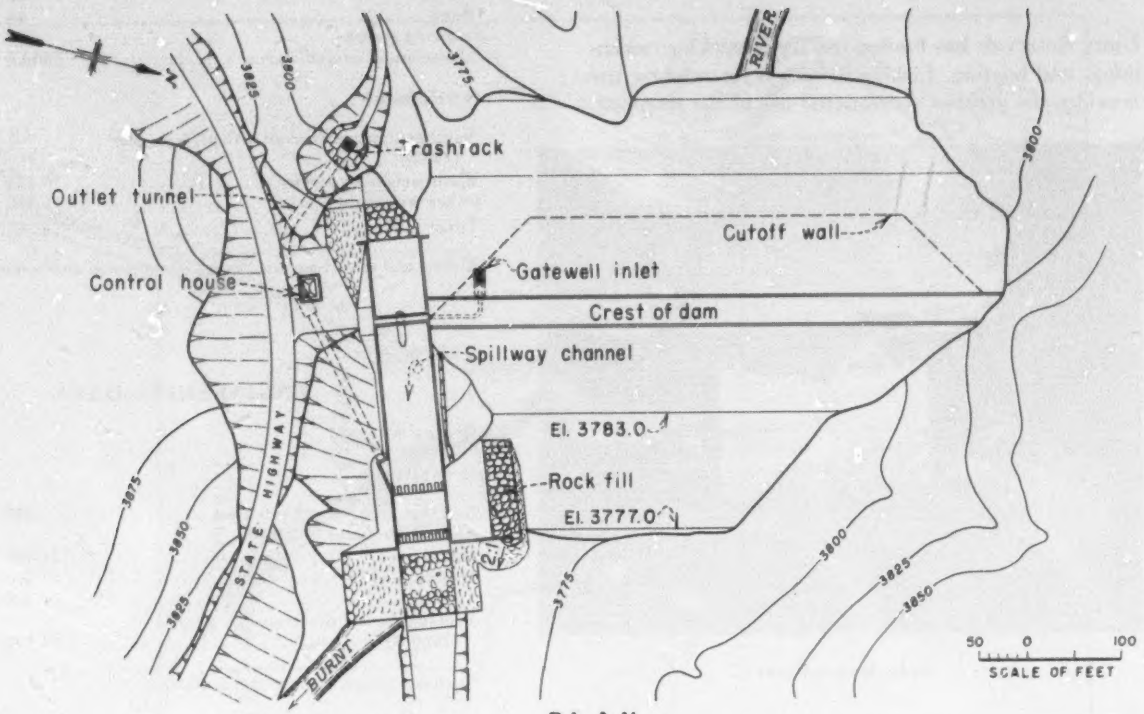
Drainage area above Unity Dam	309	mi²
Annual discharge (1966-80):		
Maximum (1974)	121,600	acre-ft
Minimum (1977)	17,400	acre-ft
Average	61,300	acre-ft
Average annual diversions by project (1966-80)[2]	84,300	acre-ft

[2]Includes return flows to Burnt River.

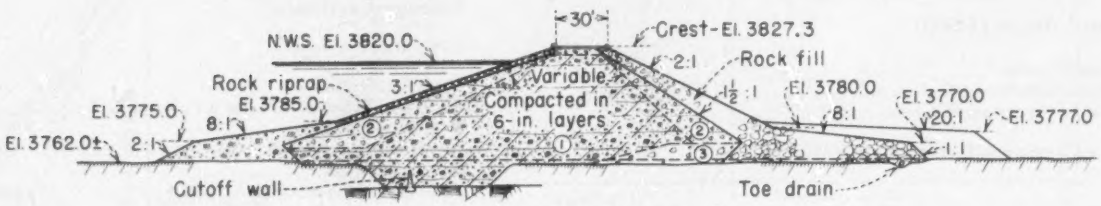
Storage Facilities

UNITY DAM

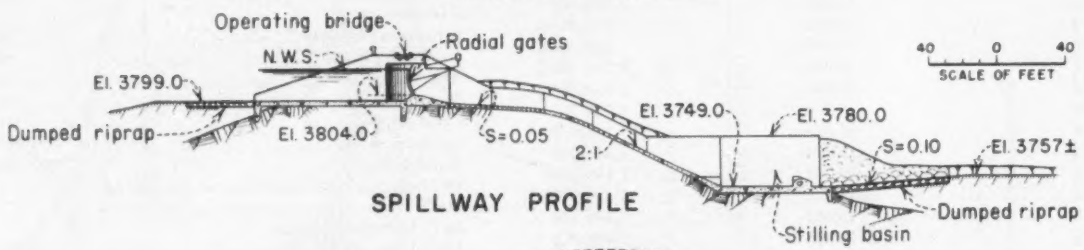
Type: Zoned earthfill		
Location: On Burnt River 40 mi southwest of Baker, Oreg.		
Construction period: 1936-38		
Reservoir, Unity:		
Total capacity at El. 3820	25,800	acre-ft
Active capacity	25,200	acre-ft
Surface area	926	acres
Dimensions:		
Structural height	82	ft
Hydraulic height	58	ft
Top width	30	ft
Maximum base width	425	ft
Crest length	694	ft
Crest elevation	3827.3	ft
Total volume	254,000	yd³
Spillway: Concrete-lined open channel in the right abutment controlled by two 24- by 16-ft radial gates.		
Elevation, top of gates	3820.0	ft
Crest elevation	3804.0	ft
Capacity at El. 3823.7	13,900	ft³/s
Outlet works: Concrete-lined circular tunnel through right abutment controlled by two 2.75-ft-square high-pressure slide gates. Capacity at El. 3820	620	ft³/s
Foundation: Firmly cemented tuff-breccia overlain with unconsolidated alluvial valley-fill and compacted terrace deposits.		
Special treatment: Cement grout curtain beneath cutoff wall.		



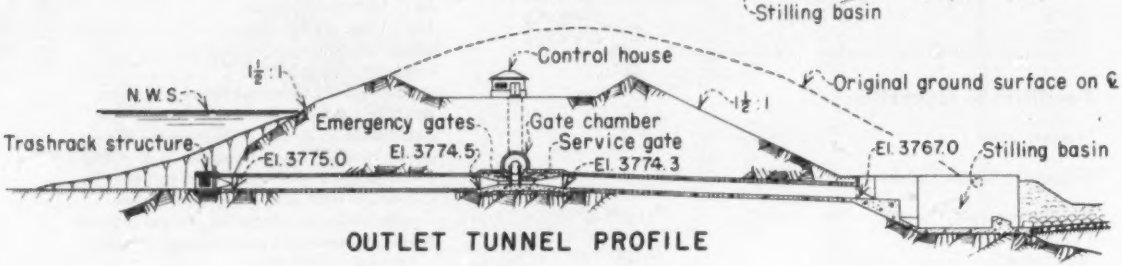
PLAN



MAXIMUM SECTION



SPILLWAY PROFILE



OUTLET TUNNEL PROFILE

Unity Dam, Plan and Sections

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